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be content to conserve its existing law and order by means of education; it must seek to make the fruits of education the means for its progress.

We have seen how the psychology of values emerged as an attempt to develop a scientific theory of human goods over against the absolutistic ethical theory. We have sketched its progress and noted its social significance. It has served the cause of progress; it has emphasized the need for revaluation and reorganization of social activities. We have also seen how, on the other hand, the psychology of values has been pressed into service to bolster up the very thing to which it constituted a reaction. Certain values have been apotheosized and given absolute significance; they are viewed as things to be conserved. The plea here is that the psychology of values should not turn traitor to its own cause by becoming a conservative and conservator. A scientific psychology must realize that when it is dealing with values it is dealing with progressive forces. Values are instruments of progress, and without change in the direction of progress they lose their function and meaning. A value is not an absolute unchanging piece of reality, but a characteritsic of nature by means of which organic activity is made possible and carried to its perfection.

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BEHAVIORISM AND GENETIC PSYCHOLOGY

I HAVE been asked to review the new edition of Hobhouse's *Mind in Evolution.*[1] I shall attempt to do so by describing my reaction to the psychological situation in which Thorndike,[2] Hobhouse,[3] and Watson[4] are centers of widely influential initiative.

When, in 1901, Hobhouse's book was published, I was a behaviorist of the Watsonian variety, for I considered introspection a futile method and attention to the subjective unfavorable to the progress of natural science. In the development of the science of behavior (since called by Watson behaviorism) along narrowly biological lines, I foresaw the progress of psychology. I must have felt quite as confident of the value of my position as does Watson to-day, for when *Mind in Evolution* fell into my hands, I dismissed it with scant courtesy and meager attention. With a strange mingling of amusement and shame, I now confess that on the first page of the preface of my copy appear the marginal criticisms "theorist" and "bum." It was nearly fifteen years before I finished reading the volume! Could any objectivist have reacted more "behavioristically"?

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[1] L. T. Hobhouse. *Mind in Evolution,* London, Macmillan and Company, 1915. Pp. xix + 469. Second edition, revised and enlarged. The first edition of the work appeared in 1901.

[2] E. L. Thorndike. *Animal Intelligence,* New York, The Macmillan Company, 1911. This book contains the author's chief contributions to comparative psychology.

[3] *Development and Purpose* as well as *Mind in Evolution.*

[4] J. B. Watson. *Behavior: An Introduction to Comparative Psychology.* New York, Henry Holt and Company, 1914.

How different my reaction to the revised edition! I read it at once with extreme interest, discussed its materials with a group of advanced students, and when the invitation to review it came, I welcomed the opportunity.

Nevertheless, I must insist that I am still a behaviorist, for I believe in the importance of the scientific study of behavior and am more deeply interested in it than in any other scientific activity. Is it not true that, as in the case of our philosophies, there are behaviorisms and behaviorists? Watson has set before us his particular opinions concerning the study of behavior in its relations to physiology and psychology. His point of view is not new, neither is it lacking in value; but I submit that his *Psychology as the Behaviorist Views It*[5] should have been entitled *Psychology as a Behaviorist Views It.*

To put it briefly, Watson is interested in organic behavior and its evolution. He regards the presuppositions and the methods of physical science as adequate for the solution of the problems of psychology. He dogmatically asserts this adequacy and refuses to admit the possible value of other presuppositions, methods, points of view. In my opinion, his is an "illiberal attachment"[6] to an assemblage of ideas which is in itself valuable, but which certainly does not monopolize the profitable possibilities of psychology or physiology.

As contrasted with Watson, Thorndike and Hobhouse strive to command the methods and materials of physiology, as well as those of psychology as commonly defined, in the interests of genetic psychology. They are not willing to accept Watson's pronouncement; instead, while recognizing the extreme value of the methods which he upholds, they insist on freedom to employ any or all other methods which promise to advance our knowledge of the genesis of mind.

Yet another significant point must be made. Whereas Watson insists that the psychologist should work with physical tools and those alone on sensible modes of energy, Hobhouse believes, and in this he is not alone, in psychic energy, and contends that the solution of the chief problems of psychology demands its detection and the devising of means of measuring it.[7]

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[5] *Psychological Review,* 1913, Vol. 20, p. 158.

[6] I use the expression with grateful acknowledgment to Mr. Samuel McChord Crothers.

Watson's behaviorism is simply and solely the physiology of organic activity. I, for one, am not willing to admit that this constitutes all that there is or may be of a scientifically profitable genetic psychology. Thorndike, like Hobhouse, has retained an open-mindedness or liberality of view which contrasts most strikingly with that of Watson. Each seeks through the study of all observable phenomena new light on the problems of the development and evolution of mental life.

Mind in Evolution is a discussion of certain fundamental problems of genetic psychology and of materials which contribute to their solution. Thus its author bridges the gap between the first edition and the revision of his important work:

"In the years that have elapsed since the first edition was published, the subject of comparative psychology has undergone a great change. It is hardly too much to say that, owing to the activity of a group of workers in the American universities, the investigation of the animal mind has, roughly within this period, established for itself a place among the recognized sciences. Hence much that was within the hands of pioneers when this book was first written, has now been thoroughly examined. Much, of course, still remains undetermined. In some material respects I have found it necessary to modify opinions formed on the data available in 1900. In particular, the observations of Mr. H. S. Jennings have shown me that something of the nature of mind is to be carried further down in the organic world than I supposed. His results, together with other work in general psychology, have led me, however, to extend rather than to narrow the view taken in the first edition of the function of mind in evolution, and even to raise the question whether mind (in the infinitely varied forms of its activity from the groping of unconscious effort to the full clearness of conscious purpose) may not be the essential driving force in all evolutionary change. In any case, the revolution which has overtaken biological theory during the same period is profound. Its significance is as yet imperfectly grasped, but it will, I believe, be found, as time goes on, to have invested the constitution of the living being as against the environing conditions with a new importance, and in this constitution the fundamental fact everywhere is that the living being is not passive, but active, not mechanical in its reaction to things, but assertive, plastic, and, in a measure proportioned to its development, self-determining. If this is so, psychology will in the future have a larger part to play than has hitherto been supposed in the study of the rise and decay of forms of life."

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[7] *Mind in Evolution*, p. 398.

In this new edition several chapters have been substantially altered, chiefly as the above quotation indicates, because of newly discovered facts, and in addition, two new chapters have been introduced—the one on "Mind and Mechanism," the other on "Conation." There is also a new appendix, which deals with the Elberfeld horses.

The title *Mind in Evolution* has a double meaning. It refers at once to the process of mental evolution and to the function of mind in organic evolution. Hobhouse is interested in both, but a careful reading of his book indicates that the general problem of the rôle or function of mind interests him more deeply than do questions of fact in psychogenesis. *Mind in Evolution,* however, is devoted, primarily, to a consideration of the course of the evolution of mind. It outlines mental evolution in the animal kingdom, and by appeal to the facts of human and infrahuman psychology develops the outline into a system of genetic psychology. For some reason the author has depended almost wholly upon the facts of animal psychology for his construction, neglecting in a surprising way the materials of ontogenetic psychology, of psychopathology, and of social psychology. This task of tracing the course of mental evolution and of discovering the function of mind in evolution is indeed a strange one for a philosopher, publicist, and essayist, but our author has performed, or rather is performing, it with amazing insight and skill, albeit with inadequate knowledge of experimental methods and the literature of the various branches contributory to genetic psychology.

Since the original edition of *Mind in Evolution* appeared so long ago, a brief sketch of the book may not be superfluous.

The author points out that two types of correlation appear in organic behavior: the mechanical and the mental. The former is not influenced by the results of an act; the latter is so influenced. The mental factor—efficient in behavior—is called by Hobhouse conation. It is describable as an "uneasiness" which "tends to pass into some other mental state." Conation, and hence consciousness, in all probability is coextensive with life (p. 397), but its correlating function tends to increase in importance throughout "orthogenic evolution."

The organism is defined as "a structure which maintains, reproduces, and develops itself by coordinated conations, the basis of the conations and their coordination being laid by the inherited arrangement of the structure" (p. 37).

Some internally initiated organic activities and certain externally initiated reflexes are uninfluenced by their own results, but all instinctive and intelligent activities are to greater or less extent influenced by conational consciousness. Intelligence, as contrasted with instinct, involves more or less complete and explicit awareness of the end or purpose of an act. Behavioristically expressed, it is "the power of an organism to adapt action to requirement on the basis of its own experience'' (p. 108).

The principal stages in the correlation of behavior are thus designated and briefly described by Hobhouse.

I. *Correlation by Heredity.*—This is racial and slow. Although not intelligent, it is ''an indirect correlation of experience, reaction, and welfare'' (p. 396).

II. *Correlation by Coexistent Conditions.*—This involves a new factor, conation, traces of which are found in very low forms of animal life. It serves to render more plastic and efficient hereditary correlations (p. 399).[8]

III. *Correlation Based on Individual Experience.*—This is intelligence. There are four great stages.

Stage 1. Inarticulate correlation. At this stage a feeling, in conjunction with random or instinctive activity, modifies subsequent reactions. For instance, after a few reactions to the situation, a spider refuses the fly which has been dipped in turpentine. Ethically considered, such a form of response is impulsive.

Stage 2. Concrete experience and the practical judgment. At this stage, the ''related term'' appears as consciousness. Discrimination becomes obvious. Motor ideas function. Events are in a measure anticipated. But the organism's adaptability appears to be limited to its concrete environment and to immediate practical ends (p. 403).

Ethically, impulse is replaced by desire, at this stage, and the beginnings of deliberation and self-control appear. The work of intelligence from this stage onward is the correlating ''of articulate complexes in the perceptual order.''

Stage 3. Conceptual thinking and will.

Stage 4. Rational system.

The above scheme of mental evolution is rather cleverly clothed by Hobhouse from the available store of behavioristic facts, but it will undoubtedly repel many readers as too highly and extravagantly speculative. Were one to attempt a justification of the plan, it would necessarily be along lines of suggestion and stimulation of experimental inquiry.

Returning, now, to a bit of history in connection with the work of Hobhouse—it was in 1899 and just in time for use by the author of *Mind in Evolution* that Thorndike published his experimental studies in animal intelligence. In order to solve certain psychological problems and to help to complete our knowledge of mental evolution, Thorndike had studied experimentally the behavior of certain birds and mammals. His work was that of the pioneer; his conclusions were at variance with those commonly accepted; and his results contradicted those previously recorded in naturalistic studies of animals.

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[8] The reader should bear in mind that Hobhouse regards conation as an effective process, dependent in all probability upon psychic energy.

Hobhouse, with keen interest in the problems which Thorndike had attacked, reacted negatively to certain of his results and to many of his conclusions. He went further and questioned the reliability of certain of the observations, while arguing also that the facts do not necessarily justify the conclusions.

Whereas, Thorndike, in the light of his experimental findings, deems ideational processes as of infrequent occurrence and of slight importance in connection with the behavior of animals other than the primates, Hobhouse finds in the observations of others and in the results of certain crucial experiments which he planned and executed for himself, abundant evidences of ideation in various other mammals as well as in the monkeys and anthropoid apes.

Naturally enough, then, Hobhouse refused to build upon the data offered in Thorndike's monograph. Instead, he formulated certain problems as of fundamental importance to his scheme of mental evolution and forthwith set out to solve them by the aid of simple experimental procedures. His subjects were dogs, cats, monkeys, an ape, an otter, and an elephant.

Thorndike's experimental technique is unquestionably open to adverse criticism, and one may doubt the representativeness or even the reliability of certain of his results. There is slight probability that he has discovered the maximum capacity of the species of animal studied. It, therefore, is not unlikely that Hobhouse is correct in certain of his critical surmises. But his experiments have not yielded satisfactory grounds for the rejection of Thorndike's chief conclusions. Hobhouse is least of all a master of the technique of animal experimentation. His conditions of observation were crude; his observations themselves few and imperfectly checked. That he was unaware of several common sources of error is apparent. For instance, he seems not to have seriously considered the possibility that his presence might supply cues to correct response, yet the pet animals, especially cats and dogs, with which he was working would persistently seek such cues.

Thorndike has put the matter rather too strongly when he says "The possibility is that animals have *no images or memories at all, no ideas to associate.* Perhaps the entire fact of association in animals is the presence of sense-impressions with which are associated, by resultant pleasure, certain impulses, and that therefore, and therefore only, a certain situation brings forth a certain act."[9] Indeed, elsewhere he has importantly qualified this surmise. For example, he writes: "My opinion would be that animals *do* have representations and that such are the beginning of the rich life of ideas in man. For the most part, however, such are confined to specific and narrow practical lines. There was no evidence that my animals habitually *did* form associations of ideas from their experience throughout, or that such were constantly revived without the spur of immediate practical advantage."[10]

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[9] *Psych. Rev. Mon. Supp.*, 2, No. 4, p. 73.

Hobhouse's position contrasts sharply with the above, for concerning his observations, he writes: "The experiments suggest that animals learn by attention to a simple sequence of events. It is easiest for them to learn if the first event is an act of their own, and the second a result of that act, which gratifies or hurts them. But even in those cases their method of learning does not ordinarily, in the instances which I have observed, conform to the notion of the gradual growth or inhibition of a habit. It conforms rather to the rise of an idea, at first perhaps dimly grasped; then clearly seen; for a while waveringly held, but soon definitely established" (p. 241).

One may not safely rely upon *Mind in Evolution* for historical perspective or even for a reasonably complete survey of the facts of genetic psychology. The author has sampled the experimental literature and marshaled groups of facts in support of his theoretical position. He makes perfectly clear to us experimentalists the urgent need for further research, and his revised edition reminds us that what has been done in the last fifteen years leaves practically unaltered the fundamental ground of difference between Thorndike and Hobhouse.

Hobhouse has imagination and insight. He formulates clearly many problems and suggests, roughly, ways of solving them. The book fires one with enthusiasm for experimental inquiry. The adverse criticisms which I have expressed may seem severe, but my appreciations are no less strong, for I believe that *Mind in Evolution* has done much and will continue to aid greatly to advance a profitable genetic psychology.

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[10] Same, p. 77.